

CLAIMS:

What is claimed is:

- 1 1. A method of correcting errors in a data storage
2 medium having a plurality of tracks, comprising:
 - 3 decoding a first quantity of data that is encoded
4 using an error-correcting code and that spans multiple
5 tracks from the plurality of tracks;
 - 6 writing to the correction history record to indicate
7 which of the multiple tracks contained errors when the
8 first quantity of data was decoded; and
 - 9 decoding a second quantity of data that is encoded
10 using the error-correcting code and that spans the
11 multiple tracks, wherein a limited number of the multiple
12 tracks are decoded as erasures in accordance with the
13 correction history record.
- 1 2. The method of claim 1, further comprising
2 establishing a correction history record.
- 1 3. The method of claim 1, wherein the error correcting
2 code is a Bose-Chauduri-Hocquenghem (BCH) code.
- 1 4. The method of claim 3, wherein the Bose-Chauduri-
2 Hocquenghem code is a Reed-Solomon code.
- 1 5. The method of claim 1, wherein the data storage
2 medium is magnetic tape.

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1 6. The method of claim 1, further comprising:
2 calculating a weight for each of the multiple
3 tracks, based upon the correction history record; and
4 selecting the limited number of the multiple tracks
5 to be treated as erasures based upon the calculated
6 weight for each of the multiple tracks.

1 7. The method of claim 5, further comprising:
2 examining the correction history record to determine
3 a number of times errors have been found on each of the
4 multiple tracks; and
5 calculating the weight for each of the multiple
6 tracks as a function of the number of times errors have
7 been found on each of the multiple tracks.

1 8. A computer program product in a computer-readable
2 medium, for correcting errors in a data storage medium
3 having a plurality of tracks, comprising instructions
4 for:
5 decoding a first quantity of data that is encoded
6 using an error-correcting code and that spans multiple
7 tracks from the plurality of tracks;
8 writing to the correction history record to indicate
9 which of the multiple tracks contained errors when the
10 first quantity of data was decoded; and
11 decoding a second quantity of data that is encoded
12 using the error-correcting code and that spans the
13 multiple tracks, wherein a limited number of the multiple
14 tracks are decoded as erasures in accordance with the
15 correction history record.

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1 9. The computer program product of claim 8, comprising
2 additional instructions for:
3 establishing a correction history record.

1 10. The computer program product of claim 8, wherein the
2 error correcting code is a Bose-Chauduri-Hocquenghem
3 (BCH) code.

1 11. The computer program product of claim 10, wherein
2 the Bose-Chauduri-Hocquenghem code is a Reed-Solomon
3 code.

1 12. The computer program product of claim 8, wherein the
2 data storage medium is magnetic tape.

1 13. The computer program product of claim 8, comprising
2 additional instructions for:
3 calculating a weight for each of the multiple
4 tracks, based upon the correction history record; and
5 selecting the limited number of the multiple tracks
6 to be treated as erasures based upon the calculated
7 weight for each of the multiple tracks.

1 14. The computer program product of claim 13, comprising
2 additional instructions for:
3 examining the correction history record to determine
4 a number of times errors have been found on each of the
5 multiple tracks; and
6 calculating the weight for each of the multiple

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7 tracks as a function of the number of times errors have
8 been found on each of the multiple tracks.

1 15. A data processing system for correcting errors in a
2 data storage medium having a plurality of tracks,
3 comprising:

4 a bus system;

5 a processing unit having at least one processor and
6 connected to the bus system;

7 memory connected to the bus system; and

8 a set of instructions in the memory, wherein the
9 processing unit executes the set of instructions to
10 perform the acts of:

11 decoding a first quantity of data that is
12 encoded using an error-correcting code and that
13 spans multiple tracks from the plurality of tracks;

14 writing to the correction history record to
15 indicate which of the multiple tracks contained
16 errors when the first quantity of data was decoded;
17 and

18 decoding a second quantity of data that is
19 encoded using the error-correcting code and that
20 spans the multiple tracks, wherein a limited number
21 of the multiple tracks are decoded as erasures in
22 accordance with the correction history record.

1 16. The data processing system of claim 15, wherein the
2 processing unit executes the set of instructions to
3 perform the additional act of:

4 establishing a correction history record.

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1 17. The data processing system of claim 15, wherein the
2 error correcting code is a Bose-Chauduri-Hocquenghem
3 (BCH) code.

1 18. The data processing system of claim 17, wherein the
2 Bose-Chauduri-Hocquenghem code is a Reed-Solomon code.

1 19. The data processing system of claim 15, wherein the
2 data storage medium is magnetic tape.

1 20. The data processing system of claim 15, wherein the
2 processing unit executes the set of instructions to
3 perform the additional acts of:

4 calculating a weight for each of the multiple
5 tracks, based upon the correction history record; and
6 selecting the limited number of the multiple tracks
7 to be treated as erasures based upon the calculated
8 weight for each of the multiple tracks.

1 21. The data processing system of claim 20, wherein the
2 processing unit executes the set of instructions to
3 perform the additional acts of:

4 examining the correction history record to determine
5 a number of times errors have been found on each of the
6 multiple tracks; and

7 calculating the weight for each of the multiple
8 tracks as a function of the number of times errors have
9 been found on each of the multiple tracks.

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1 22. The data processing of claim 15, wherein the data
2 processing system is connected to a data storage device.

1 23. The data processing system of claim 15, wherein the
2 data processing system is embedded within a data storage
3 device and the data storage device reads the data storage
4 medium.

1 24. The data processing system of claim 23, wherein the
2 data storage device reads the data storage medium.